

REMARKS

Claims 1 and 3-33 are pending in this application. By this Amendment, claim 2 is canceled without prejudice to, or disclaimer of the subject matter recited therein. Claims 1 and 8 are amended. Claim 1 is amended to incorporate the subject matter of canceled claim 2. Thus, no new matter is added.

I. Personal Interview

The courtesies extended to Applicants' representative by Examiner Hiruy during the interview held August 3, 2005, are appreciated. The reasons presented at the interview as warranting favorable action are incorporated into the remarks below and constitute Applicants' record of the interview.

II. Priority

The Office Action summary indicates that the certified priority document has not been received. However, a certified copy of priority document Japanese Patent Application No. 2003-129338 was filed concurrently with this application on March 4, 2004. Evidence of the filing may be seen at the USPTO PAIR website which includes a scanned copy of the certified priority document. Accordingly, acknowledgment of receipt of the certified priority document is respectfully requested.

III. Allowable Subject Matter

The indication of allowable subject matter in claims 16, 17, 26 and 27 is appreciated, they being allowable if rewritten in independent form to all of the features of their base claim and any intervening claims. Claims 16, 17, 26 and 27, as well as the remaining pending claims are allowable for the reasons discussed below.

IV. Claim Rejections Under 35 U.S.C. § 112

Claims 21-23 and 31-33 are rejected under 35 U.S.C. §112, first paragraph. Specifically, the Office Action alleges that the claims contain subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

It is admitted in the Office Action that "applicant teaches how the power of the motor generator and the motor could be calculated and the sum of the two values could be determined to be greater than zero." As this language is the subject matter of the rejected claims, Applicants submit that the rejection is moot. In other words, it is admitted in the Office Action that there is support for the claimed subject in the specification.

The Office Action further states that "the teaching of the application suggests that a power generated by a motor could be zero. It is well known that the only time a power generated by a motor could achieve a value of zero is when the motor generator is turned off."

Applicants assert the Office Action is recharacterizing that which is admitted as being taught in the specification. For example, the specification and claims specifically recite determining a calculated value, not teaching a generated power of zero. As discussed during the interview, the subject matter recited in claims 21-23 and 31-33 is fully supported in the specification and is enabling. For example, claim 21 recites "a fifth sub-step of determining whether or not the sum of said calculated first power and said calculated second power is equal to zero, and a sixth sub-step of disconnecting, when said sum is equal to zero, said power supply from respective neutral points (M1, M2) of said first and second three-phase coils in said 2Y motor." Similar language is recited in claim 31. Claims 20-23 and 30-33 depend from claims 21 and 31 respectively.

As recited in the rejected claims, a sum of said calculated first power is a calculated first power of said 2Y motor and a calculated second power is the calculated second power of an electric motor. As clearly recited at page 20 of the specification, the control CPU 184 calculates the power from motor generator MG1 and motor generator MG2. The power of motor generator MG1 is described as a rotation angle $\theta_s \times$ the calculated generator command

torque $TR_1 = PG$. The power of motor generator 2 is the rotation angle $\theta_r \times$ the calculated generator command torque $TR_2 = PN$. The control CPU then determines whether the sum of the motor power PN and generator motor power PG, i.e., $PN + PG$, is zero or not. If the sum $PN + PG$ is zero, the control CPU 184 disconnects DC power supply 30 from neutral points M1 and M2 to drive motor generators MG1 and MG2. If the sum $PN + PG$ is not zero, the control CPU 184 drives motor generators MG1 and MG2 with DC power supply 30 connected to the neutral points M1 and M2. Thus, the subject matter recited in the claims is fully enabled in the specification. Further enabling description may be found at least at page 36 through page 37 of the specification. Thus, as admitted in the Office Action, these features are taught in the specification and therefore the claims contain subject matter thoroughly described in the specification.

Furthermore, it is important to note that the calculated sum of the power generated by the motor (2Y motor and electric generator) may have a zero value in some cases. For example, the motor generator MG2 may be driven in the regenerative mode to produce a negative value (see p. 48, lines 9-17; line 26- p. 49, line 1 of the specification), which would offset the calculated power of MG1. In other words, the sum of the first power and the second power may be equal to zero when one of the first power of the 2Y motor and the second power of the electric motor is positive and the other is negative. Accordingly, withdrawal of the rejection of claims 21-23 and 31-33 under 35 U.S.C. §112, first paragraph, is respectfully requested.

V. Claim Rejections Under 35 U.S.C. §102

Claims 1 and 3-7 are rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent Application Publication No. 2002/0105300 to Moriya et al. This patent application has matured into U.S. Patent No. 6,630,804. The rejection is respectfully traversed.

Moriya fails to disclose each and every feature recited in the claims as amended. For example, Moriya fails to disclose a power output apparatus for a hybrid vehicle, the apparatus comprising a first inverter; a second inverter; a 2Y motor having a first three-phase motor coil and a second three-phase motor coil functioning as stators, energization of said first and second three-phase motor coils being controlled respectively by said first and second inverters; a power supply connected between a first neutral point of said first three-phase motor coil and a second neutral point of said second three-phase motor coil; a capacitor element provided on an input side of said first and second inverters; and a control unit controlling said first or second inverter to allow a precharge operation for precharging said capacitor element to be performed, a relay disposed between said first and second three-phase coils to selectively supply current to the first and second three-phase coils according to a signal from the control unit, wherein said control unit controls said first and second inverters to allow a voltage step-up operation for increasing a power-supply voltage which is output from said power supply to a predetermined level, as well as a drive operation for driving said 2Y motor to be performed after said precharge operation is completed, and said 2Y motor starts an internal combustion engine of the hybrid vehicle, wherein said control unit controls said first and second inverters to allow a voltage step-up operation for increasing a power-supply voltage which is output from said power supply, as well as a drive operation for driving said 2Y motor to be performed after said precharge operation is completed, and said 2Y motor starts an internal combustion engine of the hybrid vehicle, as recited in amended claim 1.

Moriya relates only to a 2Y motor and a control method applicable to the apparatus having an object of controlling an input voltage to inverter circuits over a wide range to more efficiently drive the electric motor. Thus, Moriya is silent regarding the capacitor element being charged after pre-charging. Furthermore, Moriya is silent regarding an automobile, a

hybrid vehicle, or any other type of vehicle in which a 2Y motor, as recited in the claims, is structurally connected to an internal combustion engine of such a vehicle.

Additionally, regarding the newly recited feature of a relay disposed between the first and second three-phase cores to selectively supply the current to the first and second three-phase cores according to a signal from the control unit, Moriya fails to disclose such a feature. As may be clearly seen from the figures of Moriya, no such relay exists. Accordingly, Moriya fails to disclose each and every feature recited in the rejected claims, as amended. Therefore, withdrawal of the rejection of claims 1 and 3-7 is respectfully requested.

VI. Claim Rejections Under 35 U.S.C. §103

Claims 2 and 10 are rejected under 35 U.S.C. §103(a) as unpatentable over Moriya in view of U.S. Patent No. 6,529,487 to Ono et al. As claim 2 is canceled, the rejection of that claim is moot. The rejection of claim 10 is respectfully traversed.

As recited above, the subject matter of claim 2 is incorporated into independent claim 1. Therefore, the subject matter of canceled claim 2 will be discussed in reference to amended independent claim 1.

Neither Moriya nor Ono, whether considered alone or in combination, disclose or suggest each and every feature recited in the rejected claims. It is admitted in the Office Action that Moriya fails to teach the subject matter of claim 2, i.e., how the 2Y motor starts an internal combustion engine. To overcome the admitted deficiency, the Office Action combines Ono for allegedly disclosing that an electric motor starts an internal combustion engine.

There is no motivation or suggestion to make such a combination as proposed in the Office Action. For example, as stated above, the primary reference of Moriya is silent regarding hybrid vehicles or a motor vehicle of any kind. Furthermore, Moriya proposes no such use of a 2Y motor for starting a vehicle or containing a control unit which controls the

setup operations required for starting such an internal combustion engine. Rather, the problem being addressed in Moriya is the lack of a driving efficiency of such a 2Y motor when the range of the input voltage is limited.

The secondary reference of Ono relates to a traction control method using electric motors at the wheels to provide a regenerative operation to control or slow the spinning or skidding of a drive wheel. Ono discloses a starter cell motor 15 in Fig. 3, the motor 15 has the same modes as the motors connected to the respective wheels (col. 15, lines 4-13). Ono lacks any description of the type of drive motors 12, 13 or 15 and certainly provides no suggestion to replace any of such motors with a 2Y motor as described in Moriya.

Furthermore, one of ordinary skill in the art would not be motivated to use such a 2Y motor specifically due to the known problems of such 2Y motors in lacking a driving efficiency when the range of an input voltage is limited. Thus, the use of such an inefficient motor, would not be contemplated for repeatedly starting a hybrid vehicle as is required at each instance the vehicle is stopped, such as at a red light, stop sign, or other such frequent short-term stop periods. Accordingly, withdrawal of the rejection of claim 10, as well as the rejection of the subject matter of claim 2, recited in amended claim 1, is respectfully requested.

Claim 8 is rejected under 35 U.S.C. §103 as unpatentable over Moriya in view of U.S. Patent No. 5,099,186 to Rippel et al. in view of U.S. Patent No. 6,023,137 to Kumar et al.; claim 9 is rejected under 35 U.S.C. §103(a) as unpatentable over Moriya in view of U.S. Patent No. 6,203,468 to Nitta et al.; claims 11-13 are rejected under 35 U.S.C. §103(a) as unpatentable over Rippel in view of Ono and further in view of U.S. Patent No. 5,936,312 to Koide et al.; and claims 14, 15, 18, 19, 24, 25, 28 and 29 are rejected under 35 U.S.C. §103(a) as unpatentable over Moriya in view of Kumar. The rejections are respectfully traversed.

Regarding claim 9, the applied reference of Nitta was not listed on Form PTO-892 nor was a copy of the applied reference provided.

Claims 8, 9, and 11-13 are allowable for their dependency on independent claim 1 for the reasons discussed above, as well as for the additional features recited therein.

Regarding claim 8, the combination of references fails to disclose the relay recited in claim 1 having the additional features recited in claim 8. For example, the Office Action admits that Moriya fails to disclose the first and second switches as recited in original claim 8 and combines Rippel in an effort to overcome the admitted deficiency. Specifically, the Office Action alleges that the input/output port 30 shown in Fig. 1 of Rippel can be connected to the two neutral points of the 2Y motor. However, even were such a combination made, the input/output port 30 is not disclosed as having the first and second switches or the resistor element, as recited in claim 8. Additionally, as amended, the components of the first and second switch and resistor element are included in a relay and not in an input/output. Furthermore, as the input/output port does not act as a relay disposed between the first and second three-phase coil to selectively supply current to the first and second three-phase coils according to a signal of the control unit, the input/output port does not overcome the deficiencies of Moriya and Rippel.

The Office Action also admits that the input/output port 30 lacks "a first switch provided between said first neutral point and a power supply, a second switch provided between said first neutral point and said the power supply and in parallel with the first switch, and a resistor element connected between said first neutral point and said first switch." Thus, the Office Action admits that the combined reference of Rippel fails to disclose any of the features it is alleged to disclose. To overcome this additional admitted deficiency, Kumar is combined for its alleged showing of a first switch and second switch provided between the power supply and an inverter set. However, as discussed above, Kumar merely relates to

electrical propulsion system for diesel electric vehicles, such as a locomotive equipped with ac electric traction motors. Thus, merely showing a switching element connected to an inverter does not overcome the deficiencies of Rippel or Moriya, nor is there motivation or suggestion in such a reference to make the combination as alleged.

Furthermore, there is no motivation or suggestion in the references to combine the input/output port of Rippel with the driving apparatus of Moriya, or to include any of Rippel, Moriya or Kumar in a hybrid vehicle as recited in the claims. Specifically, it is noted that the 2Y motor described in the independent claims is structurally connected to the internal combustion engine of a hybrid vehicle.

As discussed in Ruiz v. A.B. Chance Co., 357 F.3d 1270, 1275 (Fed. Cir. 2004), in making the assessment of differences between the prior art and the claimed subject matter, §103 specifically requires consideration of the claimed invention "as a whole." The "as a whole" instruction in title 35 prevents evaluation of the invention part-by-part. Without this important requirement, an obviousness assessment might successfully break an invention into its component parts, then find a prior art reference corresponding to each component. Id. This line of reasoning would import hindsight into the obviousness determination by using the invention as a roadmap to find its prior art components. Further, this improper method would discount the value of combining various existing features or principles in a new way to achieve a new result - often the essence of invention. Id.

Contrary to this reasoning, §103 requires assessment of the invention as a whole. This "as a whole" assessment of the invention requires of showing that an artisan of ordinary skill in the art at the time of the invention, confronted by the same problems as the inventor and with no knowledge of the claimed invention, would have selected the various elements from the prior art and combined them in the claimed manner. In other words, §103 requires some

suggestion or motivation, before the invention itself, to make the new combination (see In re Rouffet, 149 F.3d 1350, 1355, 1356 (Fed. Cir. 1998)).

Thus, there is no motivation or suggestion to combine the 2Y motor of Moriya with the input/output port of Rippel as neither of these references relates to a hybrid vehicle or seeks to solve the problem being addressed in this application. Furthermore, there is no suggestion or motivation for one of ordinary skill to further combine the teachings of the traction inverter for diesel trains disclosed in Kumar with any of the references to solve the problem of this application. Thus, the Office Action fails to set forth a *prima facie* case of obviousness. Accordingly, withdrawal of the rejection of the claims is respectfully requested.

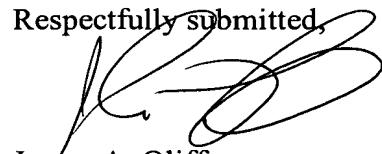
Claims 15, 18, 19, 25, 28 and 29 are allowable for their dependency on their respective base claims which are in condition for allowance as being rewritten in independent form to include allowable subject matter.

Regarding independent claims 14 and 24, neither Moriya or Kumar, whether considered alone or in combination, disclose or suggest further charging the capacitor after the precharging is completed, as recited in the "second step" in the claims. Specifically, the combination of references fails to disclose or suggest driving the 2Y motor and the electric motor while further charging the capacitor element after precharging is complete. Accordingly, withdrawal of the rejections is respectfully requested.

VII. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1 and 3-33 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,


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